This key should allow you to understand why you choose the option you did (beyond just getting a question right or wrong). More instructions on how to use this key can be found here.

If you have a suggestion to make the keys better, please fill out the short survey here.

Note: This key is auto-generated and may contain issues and/or errors. The keys are reviewed after each exam to ensure grading is done accurately. If there are issues (like duplicate options), they are noted in the offline gradebook. The keys are a work-in-progress to give students as many resources to improve as possible.

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1. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-5x - 10 > -4x - 7$$

The solution is $(-\infty, -3.0)$, which is option D.

A. (a, ∞), where $a \in [-3, -1]$

$(-3.0, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

B. $(-\infty, a)$, where $a \in [1, 4]$

$(-\infty, 3.0)$, which corresponds to negating the endpoint of the solution.

C. (a, ∞), where $a \in [2, 13]$

$(3.0, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

D. $(-\infty, a)$, where $a \in [-9, -1]$

* $(-\infty, -3.0)$, which is the correct option.

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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2. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-3 + 6x < \frac{26x + 8}{4} \leq 8 + 5x$$

The solution is None of the above., which is option E.

A. $[a, b)$, where $a \in [6, 10.5]$ and $b \in [-6, -3]$

$[10.00, -4.00)$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

B. $(-\infty, a) \cup [b, \infty)$, where $a \in [9, 16.5]$ and $b \in [-4.5, -3]$

$(-\infty, 10.00) \cup [-4.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

C. $(-\infty, a] \cup (b, \infty)$, where $a \in [6.75, 15]$ and $b \in [-9.75, -1.5]$

$(-\infty, 10.00] \cup (-4.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

D. $(a, b]$, where $a \in [8.25, 15]$ and $b \in [-6, -3]$

$(10.00, -4.00]$, which is the correct interval but negatives of the actual endpoints.

E. None of the above.

* This is correct as the answer should be $(-10.00, 4.00]$.

General Comment: To solve, you will need to break up the compound inequality into two inequalities. Be sure to keep track of the inequality! It may be best to draw a number line and graph your solution.

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3. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

$$\text{No less than 9 units from the number } -9.$$

The solution is $(-\infty, -18] \cup [0, \infty)$, which is option D.

A. $[-18, 0]$

This describes the values no more than 9 from -9

B. $(-18, 0)$

This describes the values less than 9 from -9

C. $(-\infty, -18) \cup (0, \infty)$

This describes the values more than 9 from -9

D. $(-\infty, -18] \cup [0, \infty)$

This describes the values no less than 9 from -9

E. None of the above

You likely thought the values in the interval were not correct.

General Comment: When thinking about this language, it helps to draw a number line and try points.

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4. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-6 + 8x < \frac{37x + 7}{4} \leq -9 + 5x$$

The solution is None of the above., which is option E.

A. $[a, b)$, where $a \in [4.5, 9]$ and $b \in [1.5, 7.5]$

$[6.20, 2.53)$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

B. $(-\infty, a] \cup (b, \infty)$, where $a \in [3.75, 7.5]$ and $b \in [1.5, 3.75]$

$(-\infty, 6.20] \cup (2.53, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

C. $(a, b]$, where $a \in [4.5, 7.5]$ and $b \in [0.75, 4.5]$

$(6.20, 2.53]$, which is the correct interval but negatives of the actual endpoints.

D. $(-\infty, a) \cup [b, \infty)$, where $a \in [3, 7.5]$ and $b \in [-0.75, 3]$

$(-\infty, 6.20) \cup [2.53, \infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

E. None of the above.

* This is correct as the answer should be $(-6.20, -2.53]$.

General Comment: To solve, you will need to break up the compound inequality into two inequalities. Be sure to keep track of the inequality! It may be best to draw a number line and graph your solution.

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5. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

No less than 3 units from the number 5.

The solution is None of the above, which is option E.

A. $(-\infty, -2) \cup (8, \infty)$

This describes the values more than 5 from 3

B. $(-2, 8)$

This describes the values less than 5 from 3

C. $[-2, 8]$

This describes the values no more than 5 from 3

D. $(-\infty, -2] \cup [8, \infty)$

This describes the values no less than 5 from 3

E. None of the above

Options A-D described the values [more/less than] 5 units from 3, which is the reverse of what the question asked.

General Comment: When thinking about this language, it helps to draw a number line and try points.

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6. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{4}{4} - \frac{6}{8}x > \frac{4}{9}x - \frac{9}{5}$$

The solution is $(-\infty, 2.344)$, which is option D.

A. (a, ∞), where $a \in [-1.5, 4.5]$

$(2.344, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

B. (a, ∞), where $a \in [-3, 1.5]$

$(-2.344, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

C. $(-\infty, a)$, where $a \in [-5.25, -2.25]$

$(-\infty, -2.344)$, which corresponds to negating the endpoint of the solution.

D. $(-\infty, a)$, where $a \in [0, 5.25]$

* $(-\infty, 2.344)$, which is the correct option.

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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7. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-7 + 8x > 10x \text{ or } 9 + 5x < 7x$$

The solution is $(-\infty, -3.5)$ or $(4.5, \infty)$, which is option C.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-4.06, -2.92]$ and $b \in [4.46, 5.05]$

Corresponds to including the endpoints (when they should be excluded).

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [-4.65, -3.6]$ and $b \in [2.25, 3.6]$

Corresponds to inverting the inequality and negating the solution.

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-3.6, -2.4]$ and $b \in [3.52, 6.38]$

* Correct option.

D. $(-\infty, a] \cup [b, \infty)$, where $a \in [-5.65, -4.13]$ and $b \in [3.42, 3.78]$

Corresponds to including the endpoints AND negating.

E. $(-\infty, \infty)$

Corresponds to the variable canceling, which does not happen in this instance.

General Comment: When multiplying or dividing by a negative, flip the sign.

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8. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{10}{8} - \frac{5}{2}x < \frac{4}{9}x - \frac{6}{3}$$

The solution is $(1.104, \infty)$, which is option D.

A. $(-\infty, a)$, where $a \in [-2.25, 0]$

$(-\infty, -1.104)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

B. $(-\infty, a)$, where $a \in [0, 3]$

$(-\infty, 1.104)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

C. (a, ∞), where $a \in [-1.88, -0.97]$

$(-1.104, \infty)$, which corresponds to negating the endpoint of the solution.

D. (a, ∞), where $a \in [1.05, 2.4]$

* $(1.104, \infty)$, which is the correct option.

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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9. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-9x - 9 < 4x + 5$$

The solution is $(-1.077, \infty)$, which is option C.

A. $(-\infty, a)$, where $a \in [-2.6, -0.4]$

$(-\infty, -1.077)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

B. (a, ∞), where $a \in [-0.5, 1.63]$

$(1.077, \infty)$, which corresponds to negating the endpoint of the solution.

C. (a, ∞), where $a \in [-1.14, -0.06]$

* $(-1.077, \infty)$, which is the correct option.

D. $(-\infty, a)$, where $a \in [-0.4, 2.9]$

$(-\infty, 1.077)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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10. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$5 + 4x > 7x \text{ or } 8 + 5x < 6x$$

The solution is $(-\infty, 1.667)$ or $(8.0, \infty)$, which is option D.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-2.25, 6]$ and $b \in [3.75, 11.25]$

Corresponds to including the endpoints (when they should be excluded).

B. $(-\infty, a] \cup [b, \infty)$, where $a \in [-11.25, -5.25]$ and $b \in [-2.25, 0]$

Corresponds to including the endpoints AND negating.

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-9, -5.25]$ and $b \in [-3, 3]$

Corresponds to inverting the inequality and negating the solution.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [0.75, 5.25]$ and $b \in [3.75, 9]$

* Correct option.

E. $(-\infty, \infty)$

Corresponds to the variable canceling, which does not happen in this instance.

General Comment: When multiplying or dividing by a negative, flip the sign.